

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Dieter SEIPLER et al.
Serial No. : To Be Assigned
Filed : Herewith
For : METHOD FOR MANUFACTURING
PIEZOELECTRIC ACTUATORS AND A
PIEZOELECTRIC ACTUATOR
Examiner : To Be Assigned
Art Unit : To Be Assigned

Assistant Commissioner for Patents
Washington, D.C. 20231

**PRELIMINARY AMENDMENT AND
37 C.F.R. § 1.125 SUBSTITUTE SPECIFICATION STATEMENT**

SIR:

Please amend the above-identified application before examination, as set forth below.

IN THE SPECIFICATION AND ABSTRACT:

In accordance with 37 C.F.R. § 1.121(b)(3), a Substitute Specification (including the Abstract but without claims) accompanies this response. It is respectfully requested that the Substitute Specification (and Abstract) be entered to replace the Specification of record.

IN THE CLAIMS:

On the first page of the claims, first line, change "Patent Claims" to:

--What Is Claimed Is--.

Without prejudice, please cancel original claims 1 to 13 and please add new claims 14 to 17 as follows:

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--14. (New) A piezoelectric actuator comprising:

a plurality of layers arranged one over another and composed of a piezoelectric ceramic material, each of the layers including a surface which is coated with at least one respective electrode, the electrodes being alternately connected to one other,

wherein:

each of the layers includes at least one first connecting opening and at least one second connecting opening, the first and second connecting openings penetrating a respective one of the layers in a particular area of a respective one of the electrodes,

each of the electrodes has a cut-out portion which surrounds one of the first and second connecting openings,

the layers are stacked to arrange the first and second connecting openings of all of the layers one over another, particular openings of the first and second connecting openings being alternately surrounded by the cut-out portions of the electrodes only in every other layer of the layers to alternately connect the electrodes to the first and second connecting openings, the particular openings being arranged one over another, and

the first and second connecting openings are filled with an electrically conductive paste.

15. (New) The piezoelectric actuator according to claim 14, wherein the electrodes are composed of a netlike metal layer.

16. (New) The piezoelectric actuator according to claim 14, wherein each of the layers has a peripheral edge area which is not coated with the at least one electrode.

17. (New) The piezoelectric actuator according to claim 14, wherein the layers include a bottommost layer and a topmost layer, and wherein at least one of an outer surface of a particular layer of the layers and an edge area of the piezoelectric actuator is embedded in an electrically insulating encapsulating material, the particular layer being at least one of the topmost layer and the bottommost layer.--.

REMARKS

This Preliminary Amendment cancels, without prejudice, claims 1-13 in the underlying PCT Application No. PCT/DE98/03174, and adds new claims 14-17. The new claims conform the claims to U.S. Patent and Trademark Office rules and do not add new matter to the application.

The amendments to the specification and abstract are to conform the specification and abstract to U.S. Patent and Trademark Office rules, and do not introduce new matter into the application.

The underlying PCT Application No. PCT/DE98/03174 includes an International Search Report, dated March 3, 1999, a copy of which is included. The Search Report includes a list of documents that were considered by the Examiner in the underlying PCT application.

Applicants assert that the present invention is new, non-obvious, and useful. Prompt consideration and allowance of the claims are respectfully requested.

Respectfully Submitted,

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